



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/550,514

09/23/2005

Sylvain Schwartz

4590-443

3006

33308 7590 04/23/2008  
LOWE HAUPTMAN & BERNER, LLP  
1700 DIAGONAL ROAD, SUITE 300  
ALEXANDRIA, VA 22314

EXAMINER

ZHANG, YUANDA

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

04/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/550,514	<b>Applicant(s)</b> SCHWARTZ ET AL.	
	<b>Examiner</b> YUANDA ZHANG	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-7, 10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yntema et al (US Patent 3,862,803).
4. In re claim 1, with reference to figure 1, Yntema et al disclose a laser gyro comprising: an optical ring cavity including at least three mirror (mirrors 11-13), a solid-state amplifying medium (laser gain medium 24) and a feedback system (feedback system comprising counters 20 & 21, comparator 22, electronic circuit 23, temperature control 34, and heater 36), the cavity and the amplifying medium being such that two counter-propagating optical modes can propagate at the same in opposite directions one with respect to other inside said optical cavity (lights with different polarities travel in both clockwise and counter-clockwise directions in the ring laser cavity) (col. 6 lines 35-45), the feedback system allowing the intensity of the two counter-propagating modes to be kept almost the same (maintaining the temperature of the gyro controls the length of the ring cavity which keeps wave propagations in a constant intensity) (col. 5 lines 14-

22), the feedback system comprising, inside the cavity, an optical assembly including a polarizing element (quarter wave plates 41 & 42) and a device (faraday cell 25) exhibiting a nonreciprocal effect that acts on the polarization state of the counter-propagating modes (col. 4 lines 28-35), wherein said optical assembly further includes a device (quartz crystal 28) exhibiting a reciprocal effect that also acts on the polarization state of the counter-propagating modes (col. 4 lines 35-43), the feedback system comprising control means (electronic circuit 23) for controlling at least one of the effects of said devices (electronic circuit 23 is controlling the supply of bias current to the faraday cell 25) (col. 4 lines 25-28).

5. In re claims 2 and 3, Yntema et al disclose the linear polarizer (wave plates 41 & 42) is one of the mirrors of the cavity (col. 5 lines 42-50 and see figure 3).

6. In re claims 5-7, Yntema et al disclose the reciprocal rotator, a birefringent optical plate in a non-planar cavity, exhibiting a reciprocal effect is a second linear polarizer (quartz crystal 28), the polarization direction of which is not parallel to that of the first polarizer (col. 4 lines 35-43), the feedback system consists of means for adjusting the non-reciprocal effect of the device exhibiting a non-reciprocal effect (col. 4 lines 25-28).

7. In re claim 10, Yntema et al disclose wherein the device (Faraday cell 25) exhibiting a nonreciprocal effect consists of a material exhibiting the Faraday effect and polarized by an induction coil (figure) by an adjustable electrical current (col. 4 lines 25-28).

8. In re claim 12, Yntema et al disclose the cavity is monolithic, the counter propagating optical modes propagating, inside the cavity, only in a solid material (inherent).

9. Claims 1, 8, 9 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Aronowitz (US Patent 3,867,034).

10. In re claim 1, with reference to figure 2, Aronowitz discloses a laser gyro comprising: an optical ring cavity including at least three mirror (optical ring cavity formed by mirror 52, 54, and 56) (col. 7 lines 16-19), a solid-state amplifying medium (60, establishes two counter-rotating monochromatic light beams) and a feedback system, the cavity and the amplifying medium being such that two counter-propagating optical modes can propagate at the same in opposite directions one with respect to other inside said optical cavity (inherent due to non-reciprocal rotation and reciprocal rotation, also see arrows representing directions of light propagation in figure 2, col. 3 lines 6-8), the feedback system allowing the intensity of the two counter-propagating modes to be kept almost the same (col. 7 lines 3-14), the feedback system comprising, inside the cavity, an optical assembly including a polarizing element (wave plates 62 & 64, changes polarization of the light when no electric field is applied) and a device (Faraday rotator 70, non-reciprocal rotation) exhibiting a nonreciprocal effect that acts on the polarization state of the counter-propagating modes (col. 3 lines 14-21), wherein said optical assembly further includes a device (wave plates 62 & 64, reciprocal

Art Unit: 2828

rotation, exhibit birefringence when electric field is applied) exhibiting a reciprocal effect that also acts on the polarization state of the counter-propagating modes (col. 48-56), the feedback system comprising control means (High Frequency Voltage Source 66) for controlling at least one of the effects of said devices (col. 7 lines 3-14).

11. In re claim 8, Aronowitz discloses a reciprocal effect is an optical plate exhibiting electrically controlled birefringence (controlled by High Frequency Voltage Source 66) (col. 7 lines 3-14).

12. In re claim 9 Aronowitz discloses a nonreciprocal effect consists of a material exhibiting the Faraday effect and polarized by a permanent magnet (), the feedback system consists of means for adjusting the reciprocal effect of the device exhibiting a reciprocal effect (controlled by High Frequency Voltage Source 66) (col. 7 lines 3-14).

13. In re claim 14, Aronowitz disclose wherein the cavity is optically pumped by at least one diode laser (The Examiner interprets the power source 90 as a laser diode pump source) (see figure 2).

### ***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 4, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yntema et al (US Patent 3,862,803) in view of Nilsson (US Patent 5,177,764).

16. In re claim 4, Yntema et al have disclosed the claimed invention except wherein the polarizing element is either an inclined glass plate, the angle of inclination on the optical modes then being approximately equal to the Brewster angle, or one of the faces of an element of the cavity cut at the Brewster angle of incidence. However, Nilsson discloses the linear polarizer is an inclined glass plate, the angle of inclination on the optical modes then being approximately equal to the Brewster angle (Col. 7 lines 55-62). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the polarizing element of Yntema et al with an inclination of approximately equal to Brewster angle as taught by Nilsson in order to minimize back scattering of lights passing through the polarizer.

17. In re claims 11 and 13, Yntema et al have disclosed the claimed invention except wherein the amplifying medium is base on neodymium-doped YAG and the material exhibiting the Faraday Effect are produced in the same material. However, Nilsson discloses the amplifying medium and the material exhibiting the Faraday effect are produced in the same material (birefringent material is made of YAG which is the same as solid-state laser medium, Nd:YAG; Col. 9 line 23). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a neodymium-based amplifying medium and a Faraday rotator which is made of the same material to achieve a more coherent light beam, since it has been held to be within the general skill

of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

18. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yntema et al (US Patent 3,862,803) in view of Brasseur et al (US Patent 6,731,423 B1).

19. In re claim 15, Yntema et al have disclosed the claimed invention above except the cavity comprises at least one optical fiber in the form of a ring, which includes optical couplers for the entry and exit of the counter-propagating beams and of at least one optical pump beam. However, Brasseur et al disclose an optical fiber ring having a first end (64) is coupled to a first end (entry) of the Raman chamber. A second end (exit) of the optical fiber is coupled to a second end of the Raman chamber (cavity) (Col. 2 lines 12-15). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the ring laser of Yntema et al with an optical fiber ring as taught by Brasseur et al in order to obtain a desired high output power by eliminating the spatial modes (Col. 2 lines 18-19).

### ***Double Patenting***

20. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir.



Art Unit: 2828

1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

21. Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No.

10/582,629. Although the conflicting claims are not identical, they are not patentably distinct from each other because all limitations of claim 1 of instant applicant are taught by claim 1 of the co-pending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUANDA ZHANG whose telephone number is (571)270-1439. The examiner can normally be reached on Monday-Thursday, 7:30am-6:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2828

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YZ/

04/18/08

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828